

IN THE TITLE OF THE INVENTION:

Please amend the Title of the Invention as follows:

METHOD OF LOGICALLY ERASING CONTENTS OF A CD-RW DISC WHILE  
RESERVING DISC ID

IN THE CLAIMS:

Please amend claims 1-31 as follows:

1. (Twice Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising:

accessing the PMA area in response to the erase command;

detecting and deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area; and

reserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

2. (Twice Amended) The method according to claim 1, wherein the step of reserving comprises reserving the frames containing the identification information at a predetermined leading section of the PMA area.

3. (Twice Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising:

accessing the PMA area in response to the erase command;

detecting and deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area; and

reserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc, wherein the PMA area is divided into sections by every ten number of frames, and wherein the step of reserving comprises reserving a ten number of frames which contain the identification information into a predetermined section of the PMA area so as to fill the predetermined section.

4. (Twice Amended) The method according to claim 1, further comprising the step of deleting the frames containing the identification information instead of the step of reserving the frames containing the identification information when the identification information is incapable of identifying the CD-RW disc.

5. (Twice Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising:

accessing the PMA area in response to the erase command;

detecting and deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area; and

reserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc, wherein the step of reserving comprises detecting when the identification information is composed of a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the code incapable of identifying the CD-RW disc to a code capable of identifying the CD-RW disc.

6. (Twice Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising:

accessing the PMA area in response to the erase command;

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detecting where the frames containing the identification information are located at a leading section of the PMA area and the frames containing the track information are located in a subsequent section of the PMA area after the leading section; then

deleting all of the frames which contain the track information from the PMA area, thereby logically erasing all of the contents from the program area; and

reserving the frames which contain the identification information as they are at the leading section of the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

7. (Twice Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the

contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising:

accessing the PMA area in response to the erase command;

detecting where the frames containing the identification information are located at a leading section of the PMA area and the frames containing the track information are located in a subsequent section of the PMA area after the leading section; then

31 deleting all of the frames which contain the track information from the PMA area, thereby logically erasing all of the contents from the program area; and

reserving the frames which contain the identification information as they are at the leading section of the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc, wherein the PMA area is divided into sections by every ten number of frames, and wherein the step of reserving comprises reserving a ten number of frames which contain the identification information in the leading section of the PMA area.

8. (Twice Amended) The method according to claim 6, further comprising the step of deleting the frames containing the identification information instead of the

step of reserving the frames containing the identification information when the identification information is incapable of identifying the CD-RW disc.

9. (Twice Amended) The method according to claim 6, wherein the step of reserving comprises detecting when the identification information is composed of a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the code incapable of identifying the CD-RW disc to a code capable of identifying the CD-RW disc.

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10. (Twice Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising:

accessing the PMA area in response to the erase command;

detecting where first frames containing the identification information are located at a part of a leading section of the PMA area and where second frames containing the track information are located after the first frames in the PMA area; then

deleting all of the second frames so as to logically erase all of the contents from the program area; and

reserving the first frames in the leading section of the PMA area while filling the leading section by the first frames to complete the leading section, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

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11. (Twice Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising:

accessing the PMA area in response to the erase command;

detecting where first frames containing the identification information are located at a part of a leading section of the PMA area and where second frames containing the track information are located after the first frames in the PMA area; then

deleting all of the second frames so as to logically erase all of the contents from the program area; and

reserving the first frames in the leading section of the PMA area while filling the leading section by the first frames to complete the leading section, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc, wherein

the PMA area is divided into sections by every ten number of frames, and wherein the step of reserving comprises reserving a ten number of frames which contain the identification information into the leading section of the PMA area so as to fill the leading section.

12. (Twice Amended) The method according to claim 10, further comprising the step of deleting the frames containing the identification information instead of the step of reserving the frames containing the identification information when the identification information is incapable of identifying the CD-RW disc.

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13. (Twice Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising:

accessing the PMA area in response to the erase command;

detecting where first frames containing the identification information are located at a part of a leading section of the PMA area and where second frames containing the track information are located after the first frames in the PMA area; then

deleting all of the second frames so as to logically erase all of the contents from the program area; and

reserving the first frames in the leading section of the PMA area while filling the leading section by the first frames to complete the leading section, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc, wherein the step of reserving comprises detecting when the identification information is composed of a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the code incapable of identifying the CD-RW disc to a code capable of identifying the CD-RW disc.

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14. (Twice Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being divided into a leading section and subsequent sections and being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising:

accessing the PMA area in response to the erase command;

detecting where first frames containing the identification information are located at a subsequent section of the PMA area and where second frames

containing the track information are located in either of the leading section and the subsequent sections except for that containing the first frames; then

deleting all of the second frames so as to logically erase all of the contents from the program area; and

reserving the first frames in the leading section of the PMA area by copying the first frames from the subsequent sections while deleting the first frames from the subsequent sections, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

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15. (Twice Amended) The method according to claim 14, wherein the PMA area is divided into sections by every ten number of frames, and wherein the step of reserving comprises reserving a ten number of frames which contain the identification information into the leading section of the PMA area so as to fill the leading section.

16. (Twice Amended) The method according to claim 14, further comprising the step of deleting the frames containing the identification information instead of the step of reserving the frames containing the identification information when the identification information is incapable of identifying the CD-RW disc.

17. (Twice Amended) The method according to claim 14, wherein the step of reserving comprises detecting when the identification information is composed of a code incapable of identifying the CD-RW disc, and then rewriting the identification

information from the code incapable of identifying the CD-RW disc to a code capable of identifying the CD-RW disc.

18. (Twice Amended) A method of logically erasing contents of a CD-RW disc having a program area and a PMA area in response to an erase command, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents recorded in the program area and another kind of frames containing identification information for identifying the CD-RW disc, the method comprising:

accessing the PMA area in response to the erase command effective to command an erase of a last track from the program area;

detecting where frames containing the identification information are located at a succeeding section of the PMA area after a preceding section of the PMA area containing frames corresponding to the last track; then

deleting the frames corresponding to the last track from the preceding section so as to logically erase the contents of the last track from the program area; and

reserving the frames containing the identification information in the preceding section of the PMA area by copying the frames containing the identification information from the succeeding section while deleting the frames containing the identification information from the succeeding section.

19. (Twice Amended) The method according to claim 18, wherein the PMA area is divided into sections by every ten number of frames, and wherein the step of reserving comprises reserving a ten number of frames which contain the identification information into the preceding section of the PMA area so as to fill the preceding section.

20. (Twice Amended) The method according to claim 18, further comprising the step of deleting the frames containing the identification information instead of the step of reserving the frames containing the identification information when the identification information is incapable of identifying the CD-RW disc.

21. (Twice Amended) The method according to claim 18, wherein the step of reserving comprises detecting when the identification information is composed of a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the code incapable of identifying the CD-RW disc to a code capable of identifying the CD-RW disc.

22. (Twice Amended) A method of logically erasing contents of a CD-RW disc having a program area and a PMA area in response to an erase command, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents recorded in the program area and another kind of

frames containing identification information for identifying the CD-RW disc, the PMA area being divided into sections by every ten number of frames, the method comprising:

accessing the PMA area in response to the erase command effective to command an erase of a last track from the program area;

detecting where a five number of frames containing the identification information are located at a section of the PMA area and where another five number of frames corresponding to the last track are located in the section of the PMA area; then

deleting the five number of the frames corresponding to the last track from the section so as to logically erase the contents of the last track from the program area; and

reserving a ten number of the frames containing the identification information in the section by duplicating the five number of the frames containing the identification information.

23. (Twice Amended) The method according to claim 22, further comprising the step of deleting the frames containing the identification information instead of the step of reserving the frames containing the identification information when the identification information is incapable of identifying the CD-RW disc.

24. (Twice Amended) The method according to claim 22, wherein the step of reserving comprises detecting when the identification information is composed of a code incapable of identifying the CD-RW disc, and then rewriting the identification

information from the code incapable of identifying the CD-RW disc to a code capable of identifying the CD-RW disc.

25. (Twice Amended) A method of logically erasing contents of a CD-RW disc having a program area and a PMA area in response to an erase command, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents recorded in the program area and another kind of frames containing identification information for identifying the CD-RW disc, the PMA area being divided into sections by every ten number of frames, the method comprising:

accessing the PMA area in response to the erase command effective to command an erase of a last track from the program area;

detecting where a five number of frames corresponding to the last track are located in a preceding section and another five number of frames corresponding to a track next to the last track are located in the preceding section, and a ten number of frames containing the identification information are located at a succeeding section of the PMA area after the preceding section; then

deleting the five number of the frames corresponding to the last track from the preceding section so as to logically erase the contents of the last track from the program area;

reserving a ten number of the frames corresponding to a track next to the last track in the preceding section by duplicating the five number of the frames corresponding to the track next to the last track; and

reserving the ten number of the frames containing the identification information in the succeeding section as they are.

26. (Twice Amended) The method according to claim 25, comprising the step of deleting the frames containing the identification information instead of the step of reserving the frames containing the identification information when the identification information is incapable of identifying the CD-RW disc.

27. (Twice Amended) The method according to claim 25, wherein the step of reserving comprises detecting when the identification information is composed of a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the code incapable of identifying the CD-RW disc to a code capable of identifying the CD-RW disc.

28. (Twice Amended) An apparatus for treating contents of a CD-RW disc, comprising:

a mount that mounts a CD-RW disc which is optically rewriteable and which has a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying

the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area;

an input that inputs an erase command effective to logically erase all of the contents from the program area of the CD-RW disc;

a pickup that accesses the PMA area of the mounted CD-RW disc in response to the erase command; and

a controller that controls the pickup to detect and delete all of the frames which contain the track information from the PMA area, thereby logically erasing all of the contents from the program area, and that controls the pickup to reserve the frames which contain the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

29. (Twice Amended) An apparatus for logically erasing contents of a CD-RW disc, comprising:

a mount that mounts the CD-RW disc having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents recorded in the program area and another kind of frames containing identification information for identifying the CD-RW disc;

an input that inputs an erase command effective to command an erase of a last track from the program area;

a pickup that accesses the PMA area in response to the erase command;  
and

a controller that controls the pickup to perform a process including:

detecting where the frames containing the identification information are located at a succeeding section of the PMA area after a preceding section of the PMA area containing the frames corresponding to the last track; then

deleting the frames corresponding to the last track from the preceding section so as to logically erase the contents of the last track from the program area; and

reserving the frames containing the identification information in the preceding section of the PMA area by copying the frames containing the identification information from the succeeding section while deleting the frames containing the identification information from the succeeding section.

30. (Twice Amended) A machine readable medium for use in an apparatus having a processor for logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, program code stored on the machine readable medium includes instructions to:

access the PMA area in response to the erase command;

detect and delete all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area; and

reserve the frames which contain the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

31. (Twice Amended) A machine readable medium for use in an apparatus having a processor for logically erasing contents of a CD-RW disc having a program area and a PMA area in response to an erase command, the program area being recorded with the contents as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents recorded in the program area and another kind of frames containing identification information for identifying the CD-RW disc; program code stored on the machine readable medium includes instructions to:

access the PMA area in response to the erase command effective to command an erase of a last track from the program area;

detect where the frames containing the identification information are located at a succeeding section of the PMA area after a preceding section of the PMA area containing frames corresponding to the last track; then

delete the frames corresponding to the last track from the preceding section so as to logically erase the contents of the last track from the program area; and

3) reserve the frames containing the identification information in the preceding section of the PMA area by copying the frames containing the identification information from the succeeding section while deleting the frames containing the identification information from the succeeding section.

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